REMARKS/ARGUMENTS

Upon entry of this Amendment, Claims 1 - 10 remain pending in the present application.

In the October 17, 2005 Office Action (hereinafter "OA"), Claim 1 and 3 were rejected under 35 U.S.C. §103(a) over U.S. Patent No. 6,804,497 to Kerth (hereinafter "Kerth") in view of U.S. Patent No. 6,674,812 to Stevenson (hereinafter "Stevenson"). Claims 2 and 4-5 were rejected under 35 U.S.C. §103(a) over Kerth in view of Stevenson, and further in view of U.S. Patent No. 6,357,544 to Horner (hereinafter "Horner") and U.S. Patent No. 5,808,509 to Baltus (hereinafter "Baltus"). Claims 6 and 7 were rejected under 35 U.S.C. §103(a) over U.S. Patent Application No. 2002/0105378 to Tapio (hereinafter "Tapio") in view of Stevenson. Claim 8 stands rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Kerth in view of Stevenson and Baltus. Applicant respectfully requests reconsideration of the claims in view of the above amendments and the comments below.

Rejections under 35 U.S.C. §103

A.   Standard

To establish and maintain a prima *facie* case of obviousness, the argument in the Office Action *requires*:

> i."some suggestion or motivation ... to combine";
> ii."a reasonable likelihood of success"; and
> iii."the prior art reference (or references when combined) must teach or suggest *all* the claim limitations." (Emphasis added)

(M.P.E.P. 2143, *In re Vaeck*, 947 F.2d 488, USPQ2d 1438 (Fed. Cir. 1991)). Accordingly, when a rejection cannot show these items *in toto*, the rejection

must be withdrawn.

B.   Rejection of Claim 1

Claims 1 was rejected under 35 U.S.C. §103(a) over Kerth in view of

Stevenson. This analysis is flawed for at least a number of reasons.

1.   Claim 1 as submitted

Claim 1 describes "a method for processing the in-phase and quadrature signal

components of [a] digitized communication signal" in "a digital intermediate frequency

downconversion circuit[.]" In that method "a digital representation of downconverted in-

phase and quadrature components" are produced. A step of *"recombining* the digital

representation of the downconverted in-phase and quadrature components with a

reconstruction filter" is used "to obtain a baseband signal substantially free of image

artifacts." (Emphasis added).

2.   The Examiner's Assertions

In the Office Action, the Examiner states that such a step of *"recombining* the

digital representation of the downconverted in-phase and quadrature components with a

reconstruction filter" is used "to obtain a baseband signal substantially free of image

artifacts[]" is present in Kerth. The citation to Kerth is from "Col. 8 lines 24 – Col. 9

Line 21" (OA, p. 3, para.1), with no further delineation of *specifically where* within this

broad expanse of art any of the individual components or steps might exist.

3. The *Kerth* reference

Turning to Kerth, Kerth contemplates a system that takes in-phase (I) and quadrature (Q) signals and digitally downconverts them (Fig. 4, item 427). Next, the signals are relayed to a "Digital Filter Circuitry" (Fig. 4, item 436.) Kerth explains that the digital filter 436 provides "a digital in-phase filtered signal 439 and the digital quadrature filtered signal 442[.]" (Kerth, col. 9, lines 12-13) There is absolutely no indication of what the filter mechanism in Kerth does beyond this broad, expansive, and utterly empty statement – only that the digital filter produces "a digital in-phase ... and the digital quadrature filtered signal [.]" (Id.)

Kerth only discloses the *result* of being filtered. Kerth does not mention in any way *how* to produce such a resulting filtered signal, let alone *what* the signals would be filtered for, or *how* such a filter might operate internally. An exhaustive search of Kerth reveals nothing more than the broad-based idea that the I and Q signals are *filtered*, but there is absolutely no clue as to what that filtered signal should be, or what is entailed in the filtering process. Accordingly, aside from the broad statement of "provid[ing] a ... filtered [in-phase or quadrature] signal", Kerth cannot be said to show, teach, or suggest anything else, let alone the specific functions entailed in the filter process.

4. The *Stevenson* Reference

Stevenson also does not show any indication of "recombining" any I and Q components in any fashion, nor does it suggest to do so. Accordingly, in this respect, Stevenson does not fix the shortcomings of Kerth.

5. Shortcomings of the rejection

Since Kerth cannot show any specific filtering results, any specific filtering processes, nor any specific functions used as part of any filtering process, Kerth does not show *"recombining* [a] digital representation of ... downconverted in-phase and quadrature components" as described in Claim 1. Additionally, as noted *supra*, Kerth give absolutely no indication of how the filtering occurs in that reference, let alone any indication of what the intended result is. Accordingly, Kerth cannot be said to suggest any such "recombining." Stevenson does not make up these shortcomings, nor does it suggest how to do so.

Accordingly, such a portion of Claim 1 cannot be shown in the cited art, nor is it suggested by the cited materials. Thus, with all due respect, the Examiner's rejection of Claim 1 over Kerth in light of Stevenson fails to meet the *prima facie* case for obviousness that is required. Applicant respectfully traverses the rejection of Claim 1 for this reason, among others. Accordingly, Applicant requests that the Examiner withdraw this rejection.

C. Rejection of Claim 3

Claim 3 was rejected under 35 U.S.C. §103(a) over Kerth in view of Stevenson. This analysis is flawed for at least a number of reasons.

1. Claim 3 as submitted

Claim 1 describes "a digital IF downconversion circuit for downconverting in-phase and quadrature signal components[.]" The circuit has "a digital reconstruction

filter for *recombining* the digital representation of the downconverted in-phase and quadrature components in a manner to obtain a digital representation of a baseband signal substantially free of image artifacts." (Emphasis added).

2. Shortcomings of the rejection of Claim 3

Claim 3 has at least some similar wording to Claim 1, in that the filter is used for *"recombining* the ... components[.]" In a manner similar to that shown with respect to Claim 1, neither Kerth nor Stevenson teach, show, or suggest any such "recombining ... of the ... components." For this reason, among others, Applicant respectfully traverses the rejection of Claim 3 over Kerth in light of Stevenson. Accordingly, Applicant requests that the Examiner withdraw this rejection.

D. Claims 2, 4, and 5

Claims 2 and 5 depend from Claim 1. Claim 4 depends from Claim 3. Claims 2, 4, and 5 stand rejected as allegedly obvious over Kerth and Stevenson, in light of Horner and Baltus.

1. The application of *Kerth* and *Stevenson* have shortcomings in the parent Claims

With respect to Kerth and Stevenson, since Claims 2 and 5 depend from Claim 1 and Claim 4 depends from Claim 3, the shortcomings of Kerth and Stevenson as shown relative to the respective parent Claims are present in the rejections of Claims 2, 4, and 5. The rejection of Claims 2 and 5 suffer the same shortcomings as those mentioned above with respect to Claim 1, mentioned above in Section B, *supra*, and the rejection of Claim 4 suffers the same shortcomings as those mentioned in Section C, *supra*.

2. Examiner incorrectly restates that *Kerth* "teaches" "recombining"

In the OA, the Examiner states in the portion rejecting Claims 2 and 5 that "Kerth and Stevenson teach recombining digitally the in-phase and quadrature signals to obtain a digitally combined signal." (OA, p. 3, last para.) The OA also offers that statement that the digital filter "is a IIR or FIR" (Id.) as support for the statement of recombining the I and Q signals. First, the statement that something is "an IIR or FIR" filter only makes a comment on the digital structure, not on the actual function of the filter. Accordingly, the statement that the digital filter "is IIR or FIR" is insufficient to teach or to suggest the act of recombining, as stated in the OA.

Further, Applicant now makes a request for the specific portions of Kerth in which the Examiner feels is a basis for "recombining", as opposed to the broad and conclusory statement that this is "taught" in Kerth. As stated above, Kerth makes no mention of the function of the included filter, nor indicates any specific function within the filter. Accordingly, Applicant strenuously objects to the broad and conclusory statement that Kerth "teaches" recombining when, in fact, Kerth teaches next to nothing about the specific filter, nor any specific functions within the filter.

3. *Horner* and *Baltus* do not cure the shortcomings of *Kerth* and *Stevenson*

Neither Horner nor Baltus show any I or Q signal, let alone any mention of "recombining" any form of these signals. Nor are these concepts suggested. Accordingly, the application of Horner and Baltus, alone or in combination, do not cure the deficiencies of the rejection of Claim 1 with respect to Kerth and

Stevenson. Accordingly, for this reason, among others, the rejections of Claims 2 and 5 are respectfully traversed. Applicant requests that the Examiner withdraw these rejections.

Similarly, the application of Horner and Baltus, alone or in combination, does not cure the deficiencies of the rejection of Claim 3 with respect to Kerth and Stevenson. Accordingly, for this reason, among others, the rejection of Claim 4 is respectfully traversed. Applicant requests that the Examiner withdraw this rejection.

E.   Claim 6

Claim 6 was rejected as allegedly obvious under 35 U.S.C. §103(a) over Tapio in view of Stevenson. This analysis is flawed for at least a number of reasons.

1.   Recitation of portions of Claim 6

Claim 6 is directed to a method of "image rejection processing of a *received* RF signal[.]" (Emphasis added). A step of "performing *downconversion* of the received RF signal to produce analog I and Q signals" is envisioned. (Emphasis added).
For each of the analog I signal and the analog Q signal, a signal is "oversampl[ed] ... to obtain an oversampled digital signal[.]" A step of "*logically combining* the digital signal with [a] digital reference signal ... *to produce* an image-canceled digital baseband signal" is then performed. (Emphasis added.)

2.   The *Tapio* reference

a.   "received RF signal"

Tapio is directed to the production of an *output* RF signal. There is no indication anywhere in Tapio that refers to an incoming RF signal, let alone any method dealing with an incoming RF signal. Accordingly, there seems to be no basis in Tapio for the inclusion of a "received RF signal", as recited in Claim 6.

b.   "performing downconversion"

Tapio, in relation to Fig. 6, refers to "summing" the "modulated signals" to "form a bandpass signal." (Tapio, para. 2) In another wording, "[t]hese baseband signals (I and Q) are converted to a bandpass signal." (Id.)

"Converting to a bandpass signal" is not an act of "downconversion". A search of Tapio fails to yield any portion that can be construed as a "downconversion" of any signal in any form. Applicant specifically requests that the Examiner provide *specific* evidence in Tapio for any downconversion, as Applicant's search of the citation has failed to turn up any mention or implication of such act.

Second, the bandpass signal is then "upconverted" to another signal. This final signal can be at the RF band, or can be upconverted further to RF. However, again, there is no mention of any form of "downconversion". In fact, since Tapio only talks about the production of RF signals and fails to address or even talk about the reception of RF signals (see section E.2.a, *supra*), this notable lack of downconversion is understandable.

c.   "logically combining ... *to produce an **image-canceled** digital baseband* signal

Finally, in the OA it is asserted that Tapio "combin[es] the digital reference signal to produce an image cancelled digital baseband signal (Fig. 9, Par. 16-18)." (OA, p. 4, last para.) This is incorrect.

In the cited portion of Tapio, the respective I and Q signals are "multiplied with a sine signal and a cosine signal[.]" (Tapio, Para. 16) The stated purpose of this multiplication is to "generate" "an intermediate frequency signal." (Id.) Thus, the action that the Examiner has identified does not, in fact, "produce an image cancelled baseband signal"; it only serves to generate an intermediate frequency signal. One should note that this IF signal is, in addition to not being "image cancelled", not at "baseband."

To further buttress this point, Tapio discloses that this "new sequence [from the result of the combination] is low pass filtered" to "eliminate the image[.]" (Tapio, Par. 17). Since this occurs to the sequence *after* mixer, the act of filtering and mixing are somehow "magically" combined by the Examiner as the result of one step. Tapio is absolutely clear – the filtering is a specific and independent step from the combining portion. In other words, the plain fact emerges that the portion of Tapio that combines the signals *cannot* produce an image-cancelled signal, let alone one at baseband.

3.   ***Stevenson* does not cure the defects of the analysis in relation to *Tapio***

The Examiner then proceeds to cite Stevenson for the proposition that the I and Q components of a single received RF signal can be logically combined in order to produce some asserted functionality claimed in Tapio (which can be shown not to exist, see Section E.2., *supra*.) The Examiner has overlooked that Stevenson does not logically combine the I and Q components of a single RF signal. The Examiner incorrectly

identifies the inputs to the circuit of Fig. 7b in Stevenson as belonging to a single RF reception. When one backtracks the sources of the items 708 and 709 in Fig. 7b of Stevenson, one will note that the inputs to these devices are defined in Fig 7a as belonging to multiple frequencies.

4.   Shortcomings of the rejection

Tapio does not show "performing *downconversion* of the *received* RF signal to produce analog I and Q signals[.]" (Emphasis added.) Nor does Tapio show "logically combining the digital [I or Q] signal with [a] digital reference signal ... *to produce an image-canceled digital baseband signal.*" (Emphasis added.) Accordingly, Tapio cannot be said to suggest any such portions. Further, Stevenson does not make up these shortcomings, nor does it suggest how to do so. Finally, the application of Stevenson does not show a ""performing *downconversion* of the received RF signal to produce analog I and Q signals" as envisioned. (Emphasis added).

For each of the analog I signal and the analog Q signal, the specific signal is "oversampl[ed] ... to obtain an oversampled digital signal[.]" A step of "logically combining of the [I or Q] signal with [a] digital reference signal" is not shown, since Stevenson shows the combination of *several* I and Q signals, all at *differing frequencies*.

Accordingly, with all due respect, the Examiner's case in the OA for the rejection of Claim 6 over Tapio in light of Stevenson fails to meet the *prima facie* case for obviousness that is required. Applicant respectfully traverses the rejection of Claim 6 for these reasons, among others. Accordingly, Applicant requests that the Examiner withdraw this rejection.

F.   Claim 7

Claim 7 depends from Claim 6. In a manner similar to that stated above in relation to Claim 6, the rejection of Claim 7 is respectfully traversed. Accordingly, Applicant requests that the Examiner withdraw this rejection.

G.   Claim 8

Claim 8 stands rejected as allegedly unpatentable over Kerth in view of Stevenson and Baltus. Applicant respectfully requests reconsideration of the claims in view of the above amendments and the comments below.

1.   Language of Claim 8

Claim 8 is directed to an image reject circuit. Claim 8 recites "a first frequency downconversion circuit employing a first local oscillator for downconverting in-phase and quadrature signal components of a digitized communication signal *to a first intermediate frequency*[.]" (Emphasis added.) The signals are introduced to "sigma delta converters for generating an in phase digital bit stream and a quadrature phase digital bit stream", where the streams are indicative of the *"the first ... frequency*[.]*"* A "mixing circuitry" is employed to "mix[] [the] respective single serial digital bit stream in-phase signal and single serial digital bit stream quadrature phase signal through a set of logic gates to produce a digital representation of downconverted in-phase and quadrature components[.]" Again, the items being mixed to produce the components are streams of data related to *"the first ... frequency*[.]*"*

2. The inclusion of *Stevenson* does not produce a workable device, let alone produce the apparatus of Claim 8.

The Examiner states that such mixing of logical streams "are well known in the art and evidenced by Stevenson." However, the Examiner overlooks that one cannot "combine the teaching of Stevenson and Kerth" to produce the item recited by Claim 8. As noted before, Stevenson mixes the components of in-phase and quadrature phase signals *at different frequencies*. In Stevenson, Fig. 7a denotes that the required and necessary inputs are components at differing frequencies. The claimed invention does not provide for a hodgepodge of components at differing frequencies. Accordingly, the combination of Stevenson and Kerth does not produce the claimed invention, let alone anything that might produce a meaningful result.

3. Shortcomings of the rejection

The combination of Kerth and Stevenson does not produce the item recited in Claim 8. Further, the inclusion of Stevenson and Tapio does not produce a meaningful result or workable device. The addition of Baltus does not cure these defects.

The combination does not show "mixing [the] respective single serial digital bit stream in-phase signal and single serial digital bit stream quadrature phase signal through a set of logic gates to produce a digital representation of downconverted in-phase and quadrature components", where the components are streams of data related to *"the first ... frequency*[.]"

Accordingly, with all due respect, the Examiner's case in the OA for the rejection of Claim 8 over Kerth in light of Stevenson fails to meet the *prima facie* case for

obviousness that is required. Further, it is highly questionable whether the proposed combination of Stevenson and Kerth would even have a meaningful result. Applicant respectfully traverses the rejection of Claim 8 for these reasons, among others. Accordingly, Applicant requests that the Examiner withdraw this rejection.
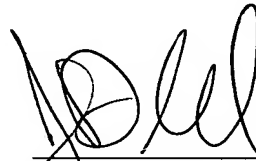
H.   Claims 9 and 10

Claims 9 and 10 depend from Claim 8. In a manner similar to that stated above in relation to Claim 8, it is believed that Claims 9 and 10 are allowable as written. Accordingly, Applicant requests that the Examiner withdraw the objection to them.

CONCLUSION

In view of the foregoing, Applicant believes all claims now pending in this

Application are in condition for allowance. The issuance of a formal Notice of

Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of

this application, please telephone the undersigned at 408-579-9216.

Respectfully submitted,

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